

APPENDIX E



lalign output for 2 vs. 3

[ISREC-Server] Date: Thu May 23 4:50:04 MET 2002

./wwtmp/lalign/.1489.1.seq : 3841 aa

ALIGN calculates a global alignment of two sequences

version 2.0u Please cite: Myers and Miller, CABIOS (1989) 4:11-17

2 3841 aa vs.

3 3841 aa

scoring matrix: BLOSUM50, gap penalties: -14/-4

100.0% identity; Global alignment score: 24253

```

      10      20      30      40      50      60
./wwwt METALAHISSERLYSTHRARGTHRASNASPGLYLYSILETHRTYRPRPRGLYVALLYSGL
      .....
3      METALAHISSERLYSTHRARGTHRASNASPGLYLYSILETHRTYRPRPRGLYVALLYSGL
      10      20      30      40      50      60

      70      80      90     100     110     120
./wwwt ILESERASPLYSILESERLYSGLGLMETVALARGARGLELYSMETVALVALLYSTHRPHE
      .....
3      ILESERASPLYSILESERLYSGLGLMETVALARGARGLELYSMETVALVALLYSTHRPHE
      70      80      90     100     110     120

      130     140     150     160     170     180
./wwwt METASPMETASPGLNASPSERGLGLGLLYSGLLETYRLEASNLEALALEHISLEALASER
      .....
3      METASPMETASPGLNASPSERGLGLGLLYSGLLETYRLEASNLEALALEHISLEALASER
      130     140     150     160     170     180

      190     200     210     220     230     240
./wwwt ASPPHEPHELELYSHISPRGLYLYSASPVALARGLELEVALALACYSLEALAASPIL
      .....
3      ASPPHEPHELELYSHISPRGLYLYSASPVALARGLELEVALALACYSLEALAASPIL
      190     200     210     220     230     240

      250     260     270     280     290     300
./wwwt EPHEARGILETYRALAPRGLALAPRTYRTHRSEPRASPLYSLELYSASPILEPHEMETP
      .....
3      EPHEARGILETYRALAPRGLALAPRTYRTHRSEPRASPLYSLELYSASPILEPHEMETP
      250     260     270     280     290     300

      310     320     330     340     350     360
./wwwt HEILETHRARGGLNLELYSGLYLEGLASPTHRLYSSERPRGLNPHEASNARGTYRPHETY
      .....
3      HEILETHRARGGLNLELYSGLYLEGLASPTHRLYSSERPRGLNPHEASNARGTYRPHETY
      310     320     330     340     350     360

      370     380     390     400     410     420
./wwwt RLELEGLASNILEALATRPVALLYSSERTYRASNILECYPHEGLLEGLASPSERASNGL
      .....
3      RLELEGLASNILEALATRPVALLYSSERTYRASNILECYPHEGLLEGLASPSERASNGL
      370     380     390     400     410     420

      430     440     450     460     470     480
./wwwt ILEPHETHRGLNLETYRARGTHRLPHESEVALILEASNANGLYHISASNGLNLYSVA
      .....

```

```
3      ILEPHETHRGLNLETYRARGTHRLEPHESERVALILEASNASNGLYHISASNGLNLYSVA
      430      440      450      460      470      480
      490      500      510      520      530      540
./wwwt LHISMETHISMETVALASPLEMETSERSERILEILECYSGGLYASPTHRRVALSERGLNG
      :
      :
3      LHISMETHISMETVALASPLEMETSERSERILEILECYSGGLYASPTHRRVALSERGLNG
      490      500      510      520      530      540
      550      560      570      580      590      600
./wwwt LLELEASPTHRVALLEVALASNLEVALPRALAHISLYSASNLEASNLYSGLNALATYRAS
      :
      :
3      LLELEASPTHRVALLEVALASNLEVALPRALAHISLYSASNLEASNLYSGLNALATYRAS
      550      560      570      580      590      600
      610      620      630      640      650      660
./wwwt PLEALALYSALALELELYSARGTHRAGLNALAILEGLPRTYRILETHRTHRPHEPHEA
      :
      :
3      PLEALALYSALALELELYSARGTHRAGLNALAILEGLPRTYRILETHRTHRPHEPHEA
      610      620      630      640      650      660
      670      680      690      700      710      720
./wwwt SNGLNVALLEMETLEGLYLYSTHRSERILESERASPLESERGLHISVALPHEASPLEILE
      :
      :
3      SNGLNVALLEMETLEGLYLYSTHRSERILESERASPLESERGLHISVALPHEASPLEILE
      670      680      690      700      710      720
      730      740      750      760      770      780
./wwwt LEGLLETYRASNILEASPSERHISLELELESERVALLEPRGLNLEGLPHELYSLEYLYSSE
      :
      :
3      LEGLLETYRASNILEASPSERHISLELELESERVALLEPRGLNLEGLPHELYSLEYLYSSE
      730      740      750      760      770      780
      790      800      810      820      830      840
./wwwt RASNASPASNGLGLARGLEGLNVALVALLYSLELEALALYSMETPHEGLYALALYSASPS
      :
      :
3      RASNASPASNGLGLARGLEGLNVALVALLYSLELEALALYSMETPHEGLYALALYSASPS
      790      800      810      820      830      840
      850      860      870      880      890      900
./wwwt ERGLLEALASERGLNASNLYSPRLETRPGLNLCYSTYRLEGLYARGPHEASNASPILEHIS
      :
      :
3      ERGLLEALASERGLNASNLYSPRLETRPGLNLCYSTYRLEGLYARGPHEASNASPILEHIS
      850      860      870      880      890      900
      910      920      930      940      950      960
./wwwt VALPRILEARGLEGLCYSVALLYSPHEALASERHISCYSLEMETASNHISPRASPLEALA
      :
      :
3      VALPRILEARGLEGLCYSVALLYSPHEALASERHISCYSLEMETASNHISPRASPLEALA
      910      920      930      940      950      960
      970      980      990      1000      1010      1020
./wwwt LYSASPLETHRGLTYRLELYSVALARGSERHISASPPRGLGLALAILEARGHISASPVAL
      :
      :
3      LYSASPLETHRGLTYRLELYSVALARGSERHISASPPRGLGLALAILEARGHISASPVAL
      970      980      990      1000      1010      1020
      1030      1040      1050      1060      1070      1080
./wwwt ILEVALSERILEVALTHRALAALALYSLYSASPILELELEVALASNASPHISLELEASN
      :
      :
3      ILEVALSERILEVALTHRALAALALYSLYSASPILELELEVALASNASPHISLELEASN
      1030      1040      1050      1060      1070      1080
      1090      1100      1110      1120      1130      1140
./wwwt HEVALARGGLARGTHRLEASPLYSARGTRPARGVALARGLYSGLALAMETMETGLYLEAL
```

```

3      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
      HEVALARGGLARGTHRLEASPLYARGTRPARGVALARGLYSGLALAMETMETGLYLEAL
          1090      1100      1110      1120      1130      1140

          1150      1160      1170      1180      1190      1200
./wwwt  AGLNILETYRLYSLYSTYRALALEGLNSERALAALAGLYLYSASPALAALALYSGLNILE
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      AGLNILETYRLYSLYSTYRALALEGLNSERALAALAGLYLYSASPALAALALYSGLNILE
          1150      1160      1170      1180      1190      1200

          1210      1220      1230      1240      1250      1260
./wwwt  ALATRPILELYSASPLYSLELEHISILETYRRTYRGLNASNSERILEASPA SPARGLELEV
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      ALATRPILELYSASPLYSLELEHISILETYRRTYRGLNASNSERILEASPA SPARGLELEV
          1210      1220      1230      1240      1250      1260

          1270      1280      1290      1300      1310      1320
./wwwt  ALGLARGILEPHEALAGLNTYRMETVALPRHISASNLEGLTHRTHRGLARGMETLYSCYS
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      ALGLARGILEPHEALAGLNTYRMETVALPRHISASNLEGLTHRTHRGLARGMETLYSCYS
          1270      1280      1290      1300      1310      1320

          1330      1340      1350      1360      1370      1380
./wwwt  LETYRRTYRLETYRALATHRLEASPLEASNALAVALLYSALALEASNGLMETTRPLYSCYS
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      LETYRRTYRLETYRALATHRLEASPLEASNALAVALLYSALALEASNGLMETTRPLYSCYS
          1330      1340      1350      1360      1370      1380

          1390      1400      1410      1420      1430      1440
./wwwt  GLNASNLELEARGHISGLNVALLYSASPLELEASPLEILELYSGLNPRLYSTHRASPALA
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      GLNASNLELEARGHISGLNVALLYSASPLELEASPLEILELYSGLNPRLYSTHRASPALA
          1390      1400      1410      1420      1430      1440

          1450      1460      1470      1480      1490      1500
./wwwt  SERVALLYSALAILEPHESE RLYSVALMETVALILETHRARGASNLEPRASPPRGLYLYS
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      SERVALLYSALAILEPHESE RLYSVALMETVALILETHRARGASNLEPRASPPRGLYLYS
          1450      1460      1470      1480      1490      1500

          1510      1520      1530      1540      1550      1560
./wwwt  ALAGLNASPPHEMETLYSLYSPHETHRGLNVALLEGLASPASPGLLYSILEARGLYSGLN
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      ALAGLNASPPHEMETLYSLYSPHETHRGLNVALLEGLASPASPGLLYSILEARGLYSGLN
          1510      1520      1530      1540      1550      1560

          1570      1580      1590      1600      1610      1620
./wwwt  LEGLVALLEVALSERPRTHRCYSSERCYSLYSGLNALAGLGLYCYSVALARGGLILETHR
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      LEGLVALLEVALSERPRTHRCYSSERCYSLYSGLNALAGLGLYCYSVALARGGLILETHR
          1570      1580      1590      1600      1610      1620

          1630      1640      1650      1660      1670      1680
./wwwt  LYSLYSLEGLYASNPRLYSGLNPRTHRASNP RPHELEGLMETILELYSPHELELEGLARG
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      LYSLYSLEGLYASNPRLYSGLNPRTHRASNP RPHELEGLMETILELYSPHELELEGLARG
          1630      1640      1650      1660      1670      1680

          1690      1700      1710      1720      1730      1740
./wwwt  ILEALAPRVALHISILEASPTHRLSERILESERALALEILELYSGLNVALASNLYSSER
      ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
3      ILEALAPRVALHISILEASPTHRLSERILESERALALEILELYSGLNVALASNLYSSER
          1690      1700      1710      1720      1730      1740

          1750      1760      1770      1780      1790      1800
```

```
./wwwt ILEASPGLYTHRALAASPASPGLASPGLGLYVALPRTHRASPGLNALAILEARGALAGLY
3      ILEASPGLYTHRALAASPASPGLASPGLGLYVALPRTHRASPGLNALAILEARGALAGLY
      1750      1760      1770      1780      1790      1800

      1810      1820      1830      1840      1850      1860
./wwwt LEGLLELELYSVALLESERPHETHRHISPRILESERPHEHISSEALAGLTHRPHEGLSE
3      LEGLLELELYSVALLESERPHETHRHISPRILESERPHEHISSEALAGLTHRPHEGLSE
      1810      1820      1830      1840      1850      1860

      1870      1880      1890      1900      1910      1920
./wwwt RLELEALACYSLELYSMETASPASPGLLYSVALALAGLALAALALEGLNILEPHELYSAS
3      RLELEALACYSLELYSMETASPASPGLLYSVALALAGLALAALALEGLNILEPHELYSAS
      1870      1880      1890      1900      1910      1920

      1930      1940      1950      1960      1970      1980
./wwwt NTHRGLYSERLYSILEGLGLASPPHEPRHISILEARGSERALALELEPRVALLEHISHIS
3      NTHRGLYSERLYSILEGLGLASPPHEPRHISILEARGSERALALELEPRVALLEHISHIS
      1930      1940      1950      1960      1970      1980

      1990      2000      2010      2020      2030      2040
./wwwt LYSSERLYSLYSGLYPRPRARGGLNALALYSTYRALAILEHISCYSILEHISALAILEPH
3      LYSSERLYSLYSGLYPRPRARGGLNALALYSTYRALAILEHISCYSILEHISALAILEPH
      1990      2000      2010      2020      2030      2040

      2050      2060      2070      2080      2090      2100
./wwwt ESERSELYSGLTHRGLNPHEALAGLNILEPHEGLPRLEHISLYSSERLEASPPRSEAS
3      ESERSELYSGLTHRGLNPHEALAGLNILEPHEGLPRLEHISLYSSERLEASPPRSEAS
      2050      2060      2070      2080      2090      2100

      2110      2120      2130      2140      2150      2160
./wwwt NLEGLHISLEILETHRPRLEVALTHRILEGLYHISILEALALELEALAPRASPGLNPEHA
3      NLEGLHISLEILETHRPRLEVALTHRILEGLYHISILEALALELEALAPRASPGLNPEHA
      2110      2120      2130      2140      2150      2160

      2170      2180      2190      2200      2210      2220
./wwwt LAALAPRTRPLYSSERTRPVALALATHRPHEILEVALLYSASPLELEMETASNASPARGL
3      LAALAPRTRPLYSSERTRPVALALATHRPHEILEVALLYSASPLELEMETASNASPARGL
      2170      2180      2190      2200      2210      2220

      2230      2240      2250      2260      2270      2280
./wwwt EPRGLYLYSLYSTHRTHRLYSLETRPVALPRASPGGLGLVALSERPRGLTHRMETVALLYS
3      EPRGLYLYSLYSTHRTHRLYSLETRPVALPRASPGGLGLVALSERPRGLTHRMETVALLYS
      2230      2240      2250      2260      2270      2280

      2290      2300      2310      2320      2330      2340
./wwwt ILEGLNALAILELYSMETMETVALARGTRPLELEGLYMETLYSASNASNHISSELYSSE
3      ILEGLNALAILELYSMETMETVALARGTRPLELEGLYMETLYSASNASNHISSELYSSE
      2290      2300      2310      2320      2330      2340

      2350      2360      2370      2380      2390      2400
./wwwt RGLYTHRSERTHRLEARGLELETHRTHRILELEHISSEALASPGLYASPLETHRGLGLNGL
3      RGLYTHRSERTHRLEARGLELETHRTHRILELEHISSEALASPGLYASPLETHRGLGLNGL
      2350      2360      2370      2380      2390      2400
```

```
      2410      2420      2430      2440      2450      2460
./wwwt YLYSILESERLYSPRASP METSERARGLEARGLEALAALAGLYSERALAILEVALLYSLE
      .....
3      YLYSILESERLYSPRASP METSERARGLEARGLEALAALAGLYSERALAILEVALLYSLE
      2410      2420      2430      2440      2450      2460

      2470      2480      2490      2500      2510      2520
./wwwt ALAGLNGLP RCYSTYRHISGLILEILETHRLEGLGLNTYRGLNLECYSALEALEALAILEA
      .....
3      ALAGLNGLP RCYSTYRHISGLILEILETHRLEGLGLNTYRGLNLECYSALEALEALEALAILEA
      2470      2480      2490      2500      2510      2520

      2530      2540      2550      2560      2570      2580
./wwwt SNASPGLCYSTYRGLNVALARGGLNVALPHEALAGLNLYSLEHISLYSGLYLESERARGL
      .....
3      SNASPGLCYSTYRGLNVALARGGLNVALPHEALAGLNLYSLEHISLYSGLYLESERARGL
      2530      2540      2550      2560      2570      2580

      2590      2600      2610      2620      2630      2640
./wwwt EARGLEPRLEGLTYRMETALAILECYSALEALECYSAALYASPPRVALLYSGLARGARG
      .....
3      EARGLEPRLEGLTYRMETALAILECYSALEALECYSAALYASPPRVALLYSGLARGARG
      2590      2600      2610      2620      2630      2640

      2650      2660      2670      2680      2690      2700
./wwwt ALAHISALAARGGLNCYSLEVALLYSASNILEASNVALARGARGGLTYRLELYSGLNHIS
      .....
3      ALAHISALAARGGLNCYSLEVALLYSASNILEASNVALARGARGGLTYRLELYSGLNHIS
      2650      2660      2670      2680      2690      2700

      2710      2720      2730      2740      2750      2760
./wwwt ALAALAVALSERGLLYSLELESERLELEPRGLTYRVALVALPRTYRTHRILEHISLELEA
      .....
3      ALAALAVALSERGLLYSLELESERLELEPRGLTYRVALVALPRTYRTHRILEHISLELEA
      2710      2720      2730      2740      2750      2760

      2770      2780      2790      2800      2810      2820
./wwwt LAHISASPPRASPTYRVALLYSVALGLNASPILEGLGLNLELYSASPVALLYSGLCYSLE
      .....
3      LAHISASPPRASPTYRVALLYSVALGLNASPILEGLGLNLELYSASPVALLYSGLCYSLE
      2770      2780      2790      2800      2810      2820

      2830      2840      2850      2860      2870      2880
./wwwt TRPPHEVALLEGLILELEMETALALYASNSGLASNASNSE RHISALAPHEILEARGLYSM
      .....
3      TRPPHEVALLEGLILELEMETALALYASNSGLASNASNSE RHISALAPHEILEARGLYSM
      2830      2840      2850      2860      2870      2880

      2890      2900      2910      2920      2930      2940
./wwwt ETVALGLASNILELYSGLNTHRLYSASPALAGLNGLYPRASPASPALALYSMETASNGLL
      .....
3      ETVALGLASNILELYSGLNTHRLYSASPALAGLNGLYPRASPASPALALYSMETASNGLL
      2890      2900      2910      2920      2930      2940

      2950      2960      2970      2980      2990      3000
./wwwt YSLETYRTHRVALCYSPVALALAMETASNILEILEMETSERLYSSERTHRTHR TYRSE
      .....
3      YSLETYRTHRVALCYSPVALALAMETASNILEILEMETSERLYSSERTHRTHR TYRSE
      2950      2960      2970      2980      2990      3000

      3010      3020      3030      3040      3050      3060
./wwwt RLEGLSERPRLYSASPVRVALLEPRALAARGPHEPHETHRGLNPRASPLYSASNPHESER
      .....
3      RLEGLSERPRLYSASPVRVALLEPRALAARGPHEPHETHRGLNPRASPLYSASNPHESER
      3010      3020      3030      3040      3050      3060
```

5/22/02 10:47 PM

```

      3670      3680      3690      3700      3710      3720
      3730      3740      3750      3760      3770      3780
./wwwt  LSE RARGARGALAGLNGLNARGALAGLSE RPRGLSE RSERERALAILEGLSE RTHRGLNSE R
      :
      :
3       LSE RARGARGALAGLNGLNARGALAGLSE RPRGLSE RSERERALAILEGLSE RTHRGLNSE R
      3730      3740      3750      3760      3770      3780
      3790      3800      3810      3820      3830      3840
./wwwt  THRPRGLNLYSGLYARGGGLYARGPRSE RLYSTHRPRSE RPRSE RGLNPRLYSLYSASNVA
      :
      :
3       THRPRGLNLYSGLYARGGGLYARGPRSE RLYSTHRPRSE RPRSE RGLNPRLYSLYSASNVA
      3790      3800      3810      3820      3830      3840

./wwwt  L
      :
3       L
```

[Back to ISREC bioinformatics group home page](#)